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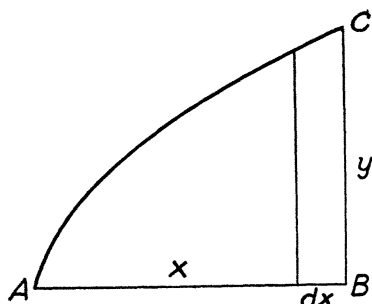


FIG. 5.

If the divisions of the surface are parallel, and if  $x$  is the abscissa and  $y$  is the ordinate, the differential of the surface will be  $ydx$ ; namely, the rectangle formed by the ordinate and the differential of the abscissa. If  $AC$  is the given curve, then  $y$  will have a given ratio to  $x$ , so that it is expressed in  $x$  alone. Suppose that  $AC$  is a parabola, then  $ax = y^2$  or  $y = \sqrt{ax}$ . The integral of this, which is  $\frac{2}{3}x\sqrt{ax}$  or  $\frac{2}{3}xy$ , is the area desired.<sup>1</sup> See Fig. 5.

This method of Bernoulli's for finding the area is simple, and is satisfactory for elementary work, although the idea of limits involved is taken care of largely by intuition.

## AMONG MY AUTOGRAPHS.

By DAVID EUGENE SMITH, Columbia University.

### 29. LEGENDRE AND CAUCHY SPONSOR ABEL.

In his work on Abel,<sup>2</sup> M. Ch. Lucas de Pesloüan gives, in a supplementary note (p. 144), the beginning of a memoir which, as he says, "probablement fut lu par Fourier en séance publique, le 30 Octobre 1826, à l'Institut, et que l'on ne comprit pas," stating in the text (p. 55) that it is said to be a development of the addition theorem.

In volume 2 of Abel's *Oeuvres Complètes* (1839) the editor, B. Holmboe, has the statement that, much as he had wished to publish in his edition the memoir presented by Abel about the close of the year 1826, "tous les efforts pour obtenir une copie de ce mémoire ont été infructueux jusqu'à présent."

In the *Mémoires présentés par divers savants à l'Académie Royale des Sciences de l'Institut de France*, published at Paris two years later (1841),<sup>3</sup> however, is the very memoir referred to, with the title: "Mémoire sur une propriété générale d'une classe très étendue de Fonctions Transcendantes, par M. N. H. Abel, Norvégien, présenté à l'Académie le 30 Octobre, 1826." On the last page (264) there is a note by Libri, the historian of mathematics, as follows: "L'Académie m'ayant fait l'honneur de me charger de surveiller l'impression de ce Mémoire, je me suis appliqué à corriger, autant que possible, les fautes d'impression," with apologies for not being able to do as well as could have been done had he been able to see the original manuscript. Indeed, when the second edition of Abel's work was published at Christiania (1881), under the editorship of Sylow and Lie, there was inserted a note on this memoir (volume 2, p. 294) to the effect that Lie

<sup>1</sup> *Ibid.*, pp. 394-395.

<sup>2</sup> N. H. Abel, *Sa vie et son oeuvre*, Paris, 1906.

<sup>3</sup> Vol. 7, pp. 176-264.

had obtained, in 1874, the permission of the Académie des Sciences of Paris to consult the original manuscript, but upon searching the archives it was found that it had never been seen after the first printing.

Among my autographs is an interesting document bearing upon the matter and, so far as I have been able to ascertain, thus far unpublished. It consists of four pages in the handwriting of Legendre and is signed by him and Cauchy. On the first page is a note in another hand, "29 Juin 1829." There is nothing to show what this date means, but it seems to indicate that the Académie was considering the printing of the article which had already been presented. At any rate, the report is upon the question of the value of the memoir. It begins with the words: "Report on a memoir relative to a general property of 'une classe très étendue de fonctions transcendentes.' The Académie has directed M. Legendre<sup>1</sup> and me to report concerning a memoir of M. Abel relative to a general property of a class 'très étendue,' of transcendent functions." It then goes on to describe the nature of the functions and to mention that they have certain properties which are analogous to those of logarithmic and elliptic functions. It speaks of the fact that Abel had already planned for printing a portion of it in Crelle's journal, of his great promise in science, and of the serious loss to the world in his early death, just as he was working upon several new memoirs. It concludes with the recommendation that the memoir be published in the collection of those of foreign scientists.

The recommendation seems to show that it was written about the date mentioned, which was nearly three months after Abel's death, and that this advice was followed. In the publication of 1841, Libri had attempted the necessary corrections.

That there should have seemed to be necessary such a recommendation with respect to a memoir by a man like Abel only goes to show how little he was generally known at the time and how careful the Académie was as to the papers which bore its seal of approval.<sup>2</sup>

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## QUESTIONS AND DISCUSSIONS.

EDITED BY C. F. GUMMER, Queen's University, Kingston, Ont., Canada.

### DISCUSSIONS.

When the forces of modernism have reformed our civil year and reduced its irregularities to a minimum, all calendars will be perpetual, and the Dominical or Sunday letter will cease to control our destinies. Until that time, though less mysterious than those lunar influences that combine with it to generate the movements of the movable feasts, the Sunday letter retains its place in our

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<sup>1</sup> Although written by Legendre, he phrases the report as if it was due to Cauchy.

<sup>2</sup> I am indebted to Mr. Jekuthial Ginsburg for aid in tracing some of these facts.